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ORIGINAL RESEARCH

Attachment Styles Within the Coach-Athlete Dyad: Preliminary Investigation and Assessment Development

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The present preliminary study aimed to develop and examine the psychometric properties of a new sport-specific self-report instrument designed to assess athletes' and coaches' attachment styles. The development and initial validation comprised three main phases. In Phase 1, a pool of items was generated based on pre-existing self-report attachment instruments, modified to reflect a coach and an athlete's style of attachment. In Phase 2, the content validity of the items was assessed by a panel of experts. A final scale was developed and administered to 405 coaches and 298 athletes (N = 703 participants). In Phase 3, confirmatory factor analysis of the obtained data was conducted to determine the final items of the Coach-Athlete Attachment Scale (CAAS). Confirmatory factor analysis revealed acceptable goodness of fit indexes for a 3-first order factor model as well as a 2-first order factor model for both the athlete and the coach data, respectively. A secure attachment style positively predicted relationship satisfaction, while an insecure attachment style was a negative predictor of relationship satisfaction. The CAAS revealed initial psychometric properties of content, factorial, and predictive validity, as well as reliability.

Keywords: attachment, avoidant, anxious, relationships, athlete, coach

Within the sport coaching literature, individual difference characteristics have been a major consideration of both leadership and relational models. For example, the multidimensional model (Chelladurai, 1993) and mediational model (Smoll & Smith, 1989) of coach leadership highlight the importance of such individual difference characteristics as age, gender, and self-esteem (Smith & Smoll, 2007; Smoll, Smith, Barnett, & Everett, 1993) in influencing coaching behaviors. More recent developments of relational models such as Jowett's (2007) 3+1Cs conceptual model have also considered individual difference characteristics including age, gender, experience, and personality as antecedents of the quality of coach-athlete

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relationships. Although both theory and research highlight the role of individual difference characteristics, there is still need for further exploration, especially as this pertains to personality characteristics and individuals' dispositional orientations. Davis and Jowett (2010) proposed that Bowlby's (1969/1982) attachment theory can supply a sound theoretical framework for studying individual difference characteristics within the interpersonal relational context formulated by the coach and the athlete. However, the application or usefulness of a theory relies on its measurability. A valid and reliable measure of the main constructs of attachment theory will allow us to test and further advance the theory on one hand, and generate knowledge and understanding in the context of sport on the other. Therefore, the purpose of the current study was to develop and examine the psychometric properties of a new self-report measure of attachment styles of athletes and coaches as an individual difference characteristic.

Basic Tenants of Attachment Theory

Attachment theory was pioneered by John Bowlby (1969/1982, 1973, 1979) to explain the origins of social behavior and emotional bonds formed between infants and their primary caregivers (also labeled attachment figures). In the development of attachment theory, Bowlby (1969/1982) drew on concepts from ethology, cybernetics, developmental psychology, and psychodynamic theory. Bowlby was heavily influenced by evolutionary theory and his colleagues in the field of ethology. Bowlby followed the work of Lorenz's (1952) theories about imprinting, which highlighted the tendency for newly hatched gosling birds to instinctively follow the first moving object seen. In addition, Bowlby was also influenced by the work of Hinde (1966) and Harlow (1959), who showed that animals' ties to their mothers were not entirely due to classical conditioning based on feeding, but rather on a fundamental instinctual behavioral system that has a goal of increasing security and survival. In addition to ethology, attachment theory also integrates ideas from psychodynamic and object-relations theories which purport that individuals' personalities are in part shaped by their environments and the contexts of early caregiver-infant interactions, which profoundly affect how children organize their world.

In consideration of all of the above, Bowlby (1969/1982) introduced and explained attachment theory as an evolutionary adaptive behavioral system that all human beings are born with that motivates both infants and adults to form close bonds with a person who is deemed "stronger and wiser." The close bond or attachment developed between an individual and a "caregiver" potentially acts as a *secure base* from which the individual is able to explore and engage in autonomous activities while maintaining a safe haven for comfort and/or protection during times of need (Bowlby). Heavily influenced by Bowlby's work, Ainsworth and colleagues (Ainsworth, Blehar, Waters, & Wall, 1978) conducted a series of research studies that focused on exploring how infants differ in the ways they attach with their primary caregivers (usually the parents). Through these studies, Ainsworth et al. were able to categorize individual difference characteristics into three concrete psychological constructs, known as "attachment styles." These included the *secure*, *avoidant*, and *anxious-ambivalent* styles. They emphasized that individual attachment styles are heavily influenced by the actions, interactions, and responsiveness of the primary caregiver.

Based on the "strange situation" laboratory-based assessment procedure in which infants' patterns of responses to separations from and reunions with their mother were observed, Ainsworth and her colleagues (1978) observed that when caregivers were consistently available, attentive, responsive, and supportive to their infant during times of need, the infants developed a *secure* attachment style. Further, it was evident that this allowed such infants to develop a perception that they were able to rely on their primary caregivers for comfort, reassurance, and protection, thus allowing them to feel close, safe, and explorative. Infants were classified as having an *avoidant* attachment style when it was evidenced that interactions with their caregivers were continuously unresponsive, distant, and aloof (Ainsworth et al., 1978). Thus, infants with an avoidant attachment style did not seem to expect comfort, reassurance, and/or protection during times of need by their caregivers. During the "strange situation" procedure (Ainsworth et al., 1978), it was observed that avoidant infants were able to engage in exploration in the presence of their caregivers, but were unable to engage in shared play (i.e., smiling or showing toys to the caregiver). Finally, it was noticeable that an *anxious-ambivalent* attachment style was promoted by caregivers who were unpredictable and inconsistent in their caregiving behaviors. As a result, infants with an anxious-ambivalent attachment style did not seem to expect that their caregiver would be there for them when the need arose. It also became evident that such infants were unable to use their caregiver as a secure base for exploration, as they appeared consistently distressed and uncertain before and during separation from their caregiver (Ainsworth et al., 1978).

Although both Bowlby's (1969/1982, 1988) and Ainsworth et al.'s (1978) conceptual and empirical research focused on infants and young children, they acknowledged that early attachment patterns remain influential well beyond infancy. For example, Bowlby (1979) has stated that attachment relations characterize "human behavior from the 'cradle to the grave'" (p. 129). In Bowlby's view (1988), attachment styles develop as a result of caregiver-child interactions, and continue to influence a person's expectations, emotions, defenses, and behavior in subsequent relationships. Bowlby (1973) further recognized that attachment styles should not be solely regarded as fixed and unchanging entities throughout one's lifespan. A person's attachment style can at times vary in stability depending on how one engages and experiences other relationships (e.g., with peers, romantic partners, colleagues). Thus, gradual changes in a person's behavioral, cognitive, social, and emotional competencies may possibly result in gradual revisions to their attachment styles (Bowlby, 1969/1982).

Attachment Theory in Adulthood

During childhood, adolescence, and adulthood, individuals are expected to form attachments with individuals other than their parents (Bowlby, 1988). Thus, attachment bonds can be formed with a diverse set of figures including romantic partners, teachers, and close friends, as well as context-specific partners including organizational leaders, sports coaches, therapists, and counselors (Davidovitz, Mikulincer, Shaver, Izsak, & Popper, 2007; Hazan & Shaver, 1987; Mikulincer & Shaver, 2007). A study by Hazan and Shaver was seminal in that it was the first study to apply the three attachment styles by Ainsworth et al. (1978) as a framework for conceptualizing

and measuring how individuals feel, think, and behave in romantic relationships. Hazan and Shaver devised multisentence descriptions (scenarios or cameos) of each attachment style and asked participants to choose one of the three descriptions that best characterized the way they experienced their relationships and their interactions in romantic relationships. They found that the same three attachment styles that characterized childhood bonds with parents also characterized adult romantic relationships. This study opened up a major paradigm of research which over the past two decades has grown immensely both in conceptualization and measurement.

Measurement of Attachment in Adulthood

Researchers have predominantly taken two different methodological approaches to assessing attachment styles in adolescence and adulthood. Firstly, attachment styles have been assessed via interviews such as the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996) and the Current Relationship Interview (CRI; Crowell, 1990). The AAI approach is based on the fundamental idea that attachment styles can be better and more accurately reflected in an individual's narrative about his or her experiences in relationships. In essence, the AAI examines individuals' styles of discourse including their understanding, coherence, fluency, and openness about their attachment experiences with parents in childhood. Qualitative measures such as the AAI aim to assess a person's conscious awareness about attachment and probe the "unconscious mind" to reveal information related to that person's attachment "state of mind" beyond their awareness (Hesse, 1999). While attachment interviews may possibly be powerful and revealing mediums, Brennan, Clark, and Shaver (1998) stated that interview approaches are impractical for most researchers, as considerable time and financial cost is involved in conducting them.

Quantitative approaches such as self-report measures are generally considered less time-consuming and less costly assessments of attachment styles, and are subsequently popular mediums within the realm of psychology. Within attachment theory research, self-report measures are plentiful and have been primarily designed to assess more consciously held beliefs about one's attachment styles and experiences. Self-report measures of attachment either assign individuals into one of three categories (i.e., cameos/scenarios) or assess the degree or intensity to which dimensions of attachment are present (i.e., collection of items/statements). Nonetheless, researchers within the field of social psychology have supported the latter method of measure as opposed to categorical measures (e.g., Mikulincer & Shaver, 2007; Ravitz et al., 2010). Categorical measures of attachment have been criticized as limited from a theoretical and measurement point of view. For example, the mere emphasis on identifying categories of attachment style that reflects one's interpersonal feelings, thoughts, and behaviors may render potential differences in intensity within that category and between categories as unimportant or nonexistent (Mikulincer & Shaver, 2007). Dimensional measures are considered to be capable of detecting subtle differences relative to both quantity and quality between individuals' attachment states of mind, and as such are likely to be more relevant and accurate methods in assessing the type of research questions under investigation within social research (Ravitz et al., 2010).

There is a proliferation of self-report measures that have been developed over the last two decades to measure attachment styles in diverse contexts including:

(a) the Adult Attachment Questionnaire (AAQ; Simpson, 1990); (b) Adult Attachment Scale (AAS; Collins & Read, 1990); (c) Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994); (d) Adolescent Friendship Attachment Scale (AFAS; Wilkinson, 2008); (e) Inventory of Parental and Peer Attachment Scale (IPPA; Armsden & Greenberg, 1987); and (f) Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998). These dimensional or continuous scales have either measured the insecure dimensions of attachment (i.e., anxious and avoidant) or measured all three dimensions of attachment (i.e., secure, anxious, avoidant). Another distinctive feature of these scales is that some scales specify the relational partner (attachment figure; i.e., a romantic partner, teacher, friend, therapist), while others leave it unspecified.

Among the self-report measures mentioned above, the Experiences in Close Relationships Scale (ECR) is considered to be the most popular measure of attachment styles (Mikulincer & Shaver, 2007). Brennan et al.'s (1998) ECR emerged after examining 14 available self-report measures that included 60 subscales and 323 items of adult attachment. Results from a factor analysis indicated two orthogonal 18-item dimensions that were labeled *anxiety* and *avoidance* attachment styles. The anxiety (anxious) attachment dimension emphasizes anger about separations and fears of abandonment, and reflects the extent to which people worry about the availability and supportiveness of their partner during times of need. The avoidance (avoidant) attachment dimension emphasizes a discomfort with closeness and distrust in their partner's good intentions. According to Brennan et al., individuals who score low on both of these two dimensions are said to be *securely* attached, reflecting a comfort with closeness and dependency as well as confidence that their partner will be emotionally available and supportive during times of need. Despite the scale's popularity and utility, there has been a debate in recent years regarding ECR's possible inability to directly measure the secure attachment style. For example, Backstrom and Holmes (2007) stated that measuring security indirectly does not sufficiently capture the essence of a secure attachment as was originally conceived by the work of both Bowlby (1973) and Ainsworth et al. (1978).

Attachment Theory Within Sport

Researchers have recognized the cross-fertilization of conceptual and theoretical models from one domain of psychology to others (e.g., Poczwardowski, Barrott, & Jowett, 2006). One recent example of such cross-fertilization has been noted in the application of attachment theory to the domain of sport and exercise psychology (see Carr, 2009a, 2009b; Davis & Jowett, 2010; Forrest, 2008). Guided by West et al. (1998) who proposed that during adolescence, parent-child care-giving attachments are relinquished and new attachments relationships are formed with peers, Carr (2009a) recognized the need to explore the link between adolescent child-parent attachment bonds and their impact on experiences of friendship quality in youth sport settings. In addition, Carr (2009b) proposed the importance of parental attachment within both sport and physical activity settings, by outlining the potential links with the achievement goal theory literature, as well as cognitive-behavioral literature in sport including attention, affect regulation, and competitive anxiety.

While early parental caregiving experiences are likely to mold an individual's attachment, attachment styles also can be updated and revised (Bowlby, 1973) beyond the experiences provided by parents; subsequently, attachments can be developed with other close relationship partners. Within organized sport, it has been purported that athletes' relationships with their coaches can become an important aspect of growth and development (Jowett, 2008; Jowett & Cockerill, 2003). However, until recently, little research has considered the coach as a potential attachment figure. On the premise that coaches can represent a "stronger and wiser" attachment figure (Mikulincer & Shaver, 2007) whose potential supportiveness and reliability can create a base for exploration and thus help athletes develop confidence and self-worth, Davis and Jowett (2010) studied the extent to which athletes perceived their coach to fulfill the three basic attachment functions (e.g., a secure base, safe haven, a target for proximity), and the manner in which athletes' insecure attachment styles toward the coach were associated with athletes' perceptions of satisfaction with the coach-athlete relationship and satisfaction with aspects of sport performance. They found that the coach was viewed by the athletes as an important attachment figure; a person to whom they would most likely seek a level of closeness, turn to during times of need, and rely on as a base for exploration and discovery of their sporting environment. Furthermore, they found that both insecure attachment styles (anxious and avoidant) were negatively associated with relationship satisfaction and aspects of sport satisfaction. Results also highlighted that respondents scored relatively low on both the avoidant and anxious dimensions. On that basis, it was concluded that a sense of felt security with the coach (i.e., a secure attachment style) was associated with greater levels of perceived relationship satisfaction and sport satisfaction. It was suggested that an insecure attachment style potentially presents athletes with greater levels of relationship dysfunctionality, which may be reflected in the ways they interact with their coach and engage in their sport. This study provided initial support for the importance of attachment theory within coach-athlete dyads.

The applications of attachment theory in research conducted within the context of sport and coaching are potentially vast. Thus, the aim of the current study was to develop and initially validate a coach-athlete-specific self-report instrument that measures the three attachment styles (secure, anxious, and avoidant) originally proposed (Ainsworth et al., 1978; see also, Backstrom & Holmes, 2007). While a measure that reflects the three attachment styles was the primary focus of this study, we also investigated the capacity of a measure that reflects only the two insecure attachment styles. The development of the Coach-Athlete Attachment Scale (CAAS) could permit research that aims to understand relational (e.g., coach-athlete relationship quality), motivational (e.g., coach-created motivational climate), group (team cohesion, collective efficacy), leadership (e.g., coach leadership behaviors), and other such phenomena without having to rely on instruments that have been developed for use in different contexts (e.g., family, education) and with different attachment figures (e.g., romantic partners). Utilizing instruments that have been developed with a particular context, to a different context may lead to psychometric problems and conceptual inconsistencies (Gill, Dzewaltowski, & Deeter, 1988; Nelson, 1989; Vealey, 1986). As it stands, a series of recent research studies, that have used and modified the gold standard measure of adult attachment

(e.g., ECR; Brennan et al., 1998) to suit the context of the coach-athlete relationship to date, have found the ECR to display poor psychometric properties (Davis & Jowett, 2012). Therefore, if attachment theory is to be useful for understanding the patterns and processes of coach-athlete interactions, then it may be important to have a psychometrically sound instrument to accurately assess attachment styles within this specific context.

Method

Design

DeVellis's (2003) procedure for developing and validating self-report instruments has been applied recently within sport psychology (see Rhind & Jowett, 2010). The same procedure was employed in the present investigation. According to DeVellis, researchers who develop and validate new instruments need to consider the following eight stages: (1) the constructs they intend to measure; (2) the generation of a pool of items; (3) the format of the measure; (4) the use of panels of experts to review the generated item pool; (5) the validation of the selected items; (6) the administration of items to a sample of participants; (7) the analysis of the obtained data; and (8) the optimization of the scale length. Below, we present and discuss the eight stages, followed in three phases. Phase 1 contains stages 1–3. Phase 2 contains stages 4–5 and revolves around the pool of items that was assessed by the expert panel. Phase 3 contains stages 6–8.

Phase 1: Item Generation

Based on the constructs we aimed to measure, namely, secure, anxious, and avoidant attachment styles, the generation of the initial item pool (one for the coach and one for the athlete, both of which were corresponding) was based on identifying available self-report attachment instruments that have been developed and used within diverse disciplines of psychology including social, educational, developmental, clinical, and occupational psychology. The Internet, computerized databases, search engines, journal articles, and key textbooks were reviewed to identify potentially relevant and available scales. Scales were retrieved if they appeared to deal with the specific constructs of adolescent and adult attachment (e.g., avoidance, anxiety, security). Every effort was made to try to identify every multi-item scale that had been previously published in relevant literatures. This ensured that valid and reliable attachment scales from a wide array of different relational contexts were included, such as adult romantic relationships, peer relationships, teacher-student relationships, leader-follower relationships, and therapist-client relationships. As a result of this process, 15 specific measures of attachment were retrieved, totaling 349 items. All of the items within these measures were then pooled to create a set of items for each of the three attachment styles, namely secure attachment, anxious attachment, and avoidant attachment styles. Each item was carefully considered in turn to ensure that: (a) it was central to one of the clearly defined attachment dimensions, and (b) it was suitable for use within the sport coaching context. Based on these two criteria, each item was either included or excluded from further analysis.

Items then were examined to eliminate any repetition and duplication in the items. For some items, the wording was slightly modified in an effort to more readily capture aspects related to the coach-athlete dyad. Through this process, we hoped to ensure that all items were clear, concise, distinct, comprehensible, and reflective of the three dimensions of attachment styles (cf. Anastasi, 1988).

The whole process yielded 83 items, of which 29 items represented an anxious attachment style, 33 items represented an avoidant attachment style, and 21 items represented a secure attachment style. These items were placed into six documents that reflected the six attachment styles, half of which reflected athletes' attachment styles and the other half reflected coaches' attachment styles: (a) athlete secure attachment, (b) athlete anxious attachment, (c) athlete avoidant attachment, (d) coach secure attachment, (e) coach anxious attachment, and (f) coach avoidant attachment.

Phase 2: Content Validity

The purpose of Phase 2 was to assess the content validity of the pool of items identified in Phase 1 by expert panels. Content validity is an important process of scale development and concerns the extent to which the items of a given instrument measure the specific intended domain of content (DeVellis, 2003). A commonly used and efficient way of assessing content validity is through expert opinion, and thus, for the purpose of this study, a total of six expert panels were employed, consisting a total of 48 experts to evaluate the content of the items identified in Phase 1. Each expert panel contained two sport psychology consultants, two sport psychology academics, two sport psychology Ph.D. students, and either two coaches or two national/international competitive athletes. Each expert was given a pack that contained instructions for completing this phase, definitions of the psychological constructs assessed, and a document that contained items for either athletes' or coaches' secure attachment, avoidant attachment, or anxious attachment style.

Panel experts were instructed to read the definition of the construct and to indicate whether they thought each item was "relevant" (i.e., does the question reflect the definition provided), "clear" (i.e., is the question easy to understand), and "specific" (i.e., is the item focused and not too general or ambiguous). These formed the main criteria for item inclusion. Responses were collected on a polytomous ("Yes – No – Unsure") scale. A section for comments was provided under each item to allow the experts to explain their responses or to suggest any alterations or further modifications. Finally, panel experts were asked to consider the pitch, flow, and instructions used within the questionnaire itself, and to further comment on any omissions and/or modifications they deemed necessary.

Upon completion of the expert panel review, basic statistics such as frequency analysis were conducted to determine the percentage of experts who indicated "Yes," "No," or "Unsure" regarding the relevance, clarity, and precision of each item. Items that were not deemed by 70% (.70) of the experts as meeting all three criteria mentioned above were deleted. There were instances where a couple of items seemed to fair well with the coach and some others with the athlete but were excluded, as they were unable to correspond well with one another. Following the expert panel's scrutiny of the 83 items, three item pools were generated containing 18 items for the avoidant attachment dimension, 18 items for the anxious attachment

dimension, and 10 items for the secure attachment dimension. Two corresponding versions were produced, one for the athlete and another for the coach.

Phase 3: Construct and Criterion Validity

Participants. The sample (N = 703) consisted of 405 coaches (male = 249 [61.5%], female = 156 [38.5%], M age = 43.23, SD = 13.53) and 298 athletes (male = 135 [45.3%], female = 163 [54.7%], M age = 19.43, SD = 2.10). Coaches and athletes were recruited for participation from a variety of both individual and team sports. The diverse sample of athletes represented their sports at various levels, including university (14.8%), club (34.9%), regional (25.5%), national (15.1%), and international (9.7%) levels. The sample of coaches also coached a wide range of athletes competing at different levels, including university (1.7%), club (47.7%), regional (34.1%), national, (11.1%), and international (5.4%) levels. Athletes reported being involved in their current sport for an average of 9.45 years (SD = 4.04), holding an average coach-athlete relationship length of 2.72 years (SD = 2.69), and spending a mean number of 5.30 hr (SD = 3.91) in training with their current coach each week. Coaches reported being involved with their sport for an average of 10.58 years (SD = 9.51), holding a mean coach-athlete relationship length of 3.27 years (SD = 2.54), and spending 3.52 hr (SD = 2.88) coaching their athletes per week.

Instrumentation. Two versions of the Coach-Athlete Attachment Scale (CAAS) were developed based on the findings from Phases 1 and 2. One version of the questionnaire was developed for athletes and one version was developed for coaches. In total, each questionnaire contained 46 items, of which, 18 items were designed to measure athletes' or coaches' avoidant attachment style (e.g., "I do not turn to my coach for reassurance"), 18 items to measure athletes' or coaches' anxious attachment style (e.g., "I worry that I won't fulfill my coaches' expectations"), and 10 items to measure a secure attachment style (e.g., "I know I can rely on my coach"). Both coaches and athletes were asked to indicate the extent to which they agreed with each statement on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Participants' perceptions of relationship satisfaction were measured using a subscale from the Investment Model Scale (IMS; Rusbult, Martz, & Agnew, 1998). The 22-item IMS comprises four subscales: commitment level, relationship satisfaction, quality of alternatives, and investment size. For the purpose of the current study, five items from the relationship satisfaction subscale were used (e.g., "I feel satisfied with our coach-athlete relationship"). Participants responded to each question on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Rusbult et al. (1998) reported good internal consistency scores ranging from 0.82 to 0.98 across the four subscales. More recently, a reliability score of 0.92 has been reported for the subscale of relationship satisfaction within the coach-athlete relational context (Davis & Jowett, 2010).

Procedures. Following institutional ethical approval, athletes and coaches were recruited using a number of methods. Firstly, National Governing Bodies (NGBs) from a wide range of sports (e.g., England netball, British badminton, England athletics, British triathlon) were approached via e-mail and/or telephone, and

were informed of the purpose and nature of the study and asked to participate by providing access to coaches and athletes. Due to policy regulations, NGBs were unable to provide the first author with direct contact information for athletes and coaches. Instead, they agreed to participate and provided a number of options for data collection. Participants' data were collected by the first author while attending coach-education/athlete workshops, training in sports clubs, or competing in sport events. Upon contact with the athletes or the coach, the purpose and voluntary nature of the study was explained. Upon gaining informed consent, participants were provided with a multisection questionnaire and were reassured of the anonymity and confidentiality of their responses. This process took no longer than 15 min to complete, and the first author was on hand to supervise any queries. For those athletes and coaches who could not be contacted face-to-face, NGBs were able to forward an electronic version of the multisection questionnaire to the coaches and athletes. The electronic questionnaire explained the purpose, voluntary nature, and anonymity and confidentiality of the study, as well as instructions on how to complete the questionnaire online. Following completion, data were electronically sent to a secure database for analysis.

Data Analysis. Guided by the theory of attachment, confirmatory factor analysis (CFA) was employed in an exploratory manner (Hoffmann, 1995) to investigate the fit of a three-dimensional (secure, anxious, and avoidant) and a two-dimensional (anxious and avoidance) factorial structure for the athlete and the coach data sets. CFA was conducted using the EQS 6.1 (Bentler & Wu, 2005) statistical package to test the factorial structure of a total of four theoretically based models. On one hand, Model 1 athlete (M1a) and Model 1 coach (M1c) tested a two first-order factor model reflecting athletes' and coaches' insecure attachment styles. On the other hand, Model 2 athlete (M2a) and Model 2 coach (M2c) tested a three first-order factor model reflecting athletes' and coaches' attachment styles of secure, anxious, and avoidant styles.

Structural equation modeling (*SEM*) using EQS 6.1 (Bentler & Wu, 2005) also was tested to examine the criterion (concurrent) validity of the aforementioned models. This approach allowed us to examine how well each attachment dimension mapped onto a theoretically meaningful variable such as relationship satisfaction. These analyses aimed to examine whether the two first-order factor models (M1a and M1c) or the three first-order factor models (M2a and M2c) predict stronger and better athletes' and coaches' perceptions of relationship satisfaction.

Goodness of fit indices were employed to assess the adequacy of the measurement and structural models. Following recommendations made by Hu and Bentler (1999) and Marsh (2007), the standardized root mean square residual (SRMR), the comparative fit index (CFI), the Bentler-Bonnet non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA) were used. According to Hu and Bentler (1999), CFI and NNFI scores that are equal to or above 0.90, as well as RMSEA and SRMR with values less than 0.08 (Hu & Bentler, 1999) reflect models that fit the data satisfactorily. Moreover, the predictive validity of the hypothesized models was assessed considering the direction, significance, and magnitude of each path corresponding to each of the theoretical models that were examined. Finally, we sought to examine the

proportion of variance accounted for by coaches' and athletes' attachment styles in perceptions of relationship satisfaction.

Results

Confirmatory Factor Analysis

As there was indication of multivariate non-normality in the data due to Mardia's multivariate kurtosis coefficient being relatively high, CFA analyses for the two-factor and three-factor models were tested using the robust maximum likelihood (ML) method. This method helped ensure that overestimation of the $\chi 2$ statistic was controlled for as well as adjusted for under identification of standard errors (Hu & Bentler, 1999).

Testing a Two-Factor Model of CAAS. The results from the first CFA analysis revealed that the initial pool of 36 items, reflective of 18 avoidant items and 18 anxious items of both the athlete (M1a) and coach (M1c) versions of the scale, did not meet the recommended cut-off points of the goodness of fit indices for both the athlete data (M1a: SRMR = 0.09, RMSEA = 0.07, RCFI = 0.77, RNNFI = 0.75) and the coach data (M1b: SRMR = 0.12, RMSEA = 0.06, RCFI = 0.74, RNNFI = 0.72). This therefore suggests a poor model fit. In attempt to identify the offending items that caused the misfit, post hoc model fitting procedures that incorporated both the Lagrange multiplier test (adding items) and Wald test (dropping items), were employed. In addition, the factor loading of each item was considered. All items with primary factor loadings of < .30 were deleted. The above method has been suggested as a means of identifying a general structure of a hypothesized factor model with the best items (Hoffmann, 1995). This method allowed for reaching a model for the athlete (M1a: SRMR = 0.06, RMSEA = 0.05, RCFI = 0.96; RNNFI = 0.95) and a model for the coach data (M1c: SRMR = 0.06; RMSEA = 0.06; RCFI = 0.94; RNNFI = 0.89) that met the hypothesized factorial structure with satisfactory fit statistics. We endeavored to arrive at two models that were corresponding, and thus, the resulting final models comprised of a total of 14 items, of which seven items represented the avoidant attachment style, and seven items represented the anxious attachment style. Table 1 displays standardized factor loadings and error variances for M1a and M1c.

Testing a Three-Factor Model of CAAS. CFA analysis of the three-factor model was conducted containing the original pool of 10 items reflective of the secure attachment style as well as the seven items of anxiety and seven items of avoidance noted above. Initial CFA revealed satisfactory fit indices for the athlete data (M2a: SRMR = 0.06; RMSEA = 0.04; RCFI = 0.94; RNNFI = 0 .93), yet less satisfactory fit indices for the coach data (M2c: SRMR = 0.07; RMSEA = 0.05; RCFI = 0.88; RNNFI = 0.86). To retain corresponding models with satisfactory goodness of fit indices, post hoc model fitting procedures were employed and factor loadings were considered. This method allowed for the removal of weak items from the secure subscale and allowed us to reach a three-dimensional model with suitable fit indices for both the athlete data (M2a: SRMR = 0.06; RMSEA = 0.04; RCFI = 0.97; RNNFI = 0.97) and the coach data (M2c: SRMR = 0.06; RMSEA = 0.06; RCFI = 0.90; RNNFI = 0.89). A total of 19 items represented the two three-first-order

Table 1 Factor Loadings for the 14-Item, Two-Factor Coach-Athlete Attachment Scale (CAAS)

Item	Athlete Questionnaire (M1a)		Coach Questionnaire (M1c)	
	Factor Loading	Error Variance	Factor Loading	Error Variance
Avoidant Attachment				
1. I don't usually discuss my problems or concerns with my coach/athlete.	.74	.68	.61	.79
2. I do not turn to my coach/athlete for reassurance.	.59	.81	.51	.86
3. I avoid discussing personal issues with my coach/athlete.	.75	.66	.63	.77
4. I do not rely on my coach/athlete when I have a problem to solve.	.66	.75	.61	.79
5. I do not turn to my coach /athlete when I need to get something off my chest.	.72	.69	.73	.68
6. I do not ask my coach/athlete for advice and help.	.71	.71	.69	.73
7. I do not seek out my coach/athlete when things go wrong.	.63	.78	.58	.81
Anxious Attachment				
8. I often wonder if my coach/athlete cares about me as an athlete.	.62	.79	.59	.81
9. I often worry that my coach/athlete does not value me as much as I value him/her.	.67	.75	.55	.83
10. I worry a fair amount about my coach/athlete leaving me to coach/to be coached elsewhere.	.39	.92	.64	.77
11. I am concerned that my coach/athlete will find another athlete/coach that he/she prefers.	.60	.80	.73	.69
12. I often worry that my coach/athlete does not want to coach me anymore.	.69	.73	.71	.70
13. Sometimes I worry that my coach/athlete is not as committed to me as I am to them.	.73	.68	.58	.81
14. I worry that my coach/athlete does not respect me as much as I respect him/her.	.74	.67	.66	.75

factor models, whereby five items were reflective of a secure attachment, seven items were reflective of an anxious attachment, and seven items were reflective of avoidance attachment. Table 2 displays standardized factor loading and error variances for M2a and M2c.

After analyzing the goodness of fit indices for all four models, χ^2 difference tests were performed between M1a and M2a ($\chi^2_{diff}(1) = 82.93$; $p > .05$) and between M1c and M2c ($\chi^2_{diff}(73) = 166.60$; $p < .001$). The results indicated that there were no significant differences between the two-factor and three-factor model for the athlete version, but a significant difference between the two-factor and three-factor model for the coach version of the CAAS. Model fit was not improved by moving from the two-factor model to the three-factor models, suggesting that the two-factor model for the coach is better.

Descriptive Statistics

Table 3 presents means (*Ms*), standard deviations (*SDs*), skewness, and kurtosis scores for the final seven avoidant attachment items, seven anxious attachment items, and five secure attachment items for both the athlete version and coach version of the CAAS. Cronbach's alpha estimates for each of the attachment dimensions of the athlete scales were as follows: avoidant attachment $\alpha = .86$, anxious attachment $\alpha = .82$, and secure attachment $\alpha = .86$. For the coach scales, estimates were as follows: avoidant attachment $\alpha = .82$, anxious attachment $\alpha = .83$, and secure attachment $\alpha = .75$. These scores are above the recommended criterion value of .70 (see Nunnally, 1978).

Convergent and Discriminant Validity

Convergent validity of each model within the two-factor (M1a, M1c) and the three-factor (M2a, M2c) structure was evaluated by examining whether each item has substantial loading to their hypothesized factor (Li & Harmer, 1996). Discriminant validity refers to the extent to which the factors in question exhibit uniqueness (Li & Harmer, 1996). The discriminant validity of the CAAS subscales for all four models was examined by evaluating factor correlations.

Convergent Validity.

For the two first-order factorial structure, all factor loadings were relatively high and statistically significant ($p < .05$). For M1a, factor loadings ranged from 0.59 to 0.75 ($M = 0.68$) for the avoidant attachment dimension and from 0.39 to 0.74 ($M = 0.63$) for the anxious attachment dimension. For M1c, factor loadings ranged from 0.59 to 0.75 ($M = 0.68$) for the avoidant attachment dimension and from 0.51 to 0.98 ($M = 0.68$) for the anxious attachment dimension. Correspondingly, the three first-order factorial structure reported factor loadings which were both high and statistically significant ($p < .05$). Factor loadings for the avoidant attachment dimension of M2a ranged from 0.60 to 0.74 ($M = 0.68$); for the anxious attachment dimension, 0.68–0.92 ($M = 0.76$); and for the secure attachment dimension, 0.68–0.92 ($M = 0.76$). For M2c, factor loadings for the avoidant attachment dimension ranged from 0.50 to 0.69 ($M = 0.62$); for the anxious attachment dimension, 0.57–0.72 ($M = 0.64$); and for the secure attachment dimension, 0.51–0.73 ($M = 0.61$).

Table 2 Factor Loadings for the 19-Item, Three-Factor Coach-Athlete Attachment Scale (CAAS)

	Athlete Questionnaire (M2a)		Coach Questionnaire (M2c)	
Item	Factor Loading	Error Variance	Factor Loading	Error Variance
Avoidant Attachment				
1. I don't usually discuss my problems or concerns with my coach/athlete.	.74	.67	.62	.79
2. I do not turn to my coach/athlete for reassurance.	.60	.80	.50	.87
3. I avoid discussing personal issues with my coach/athlete.	.73	.68	.64	.77
4. I do not rely on my coach/athlete when I have a problem to solve.	.65	.76	.61	.80
5. I do not turn to my coach/athlete when I need to get something off my chest.	.71	.71	.72	.69
6. I do not ask my coach/athlete for advice and help.	.73	.68	.69	.72
7. I do not seek out my coach/athlete when things go wrong.	.63	.78	.58	.82
Anxious Attachment				
8. I often wonder if my coach/athlete cares about me as an athlete.	.65	.76	.60	.80
9. I often worry that my coach/athlete does not value me as much as I value him/her.	.66	.75	.57	.83
10. I worry a fair amount about my coach/athlete leaving me to coach/to be coached elsewhere.	.39	.92	.65	.76
11. I am concerned that my coach/athlete will find another athlete/coach that he/she prefers.	.58	.82	.71	.70
12. I often worry that my coach/athlete does not want to coach me anymore.	.68	.74	.72	.70
13. Sometimes I worry that my coach/athlete is not as committed to me as I am to them.	.73	.68	.58	.82
14. I worry that my coach/athlete does not respect me as much as I respect him/her.	.74	.68	.66	.75
Secure Attachment				
15. I know that my coach/athlete is loyal to me.	.73	.68	.61	.79
16. I feel confident that our coach-athlete relationship will last.	.72	.70	.57	.82
17. I find it easy to interact with my coach/athlete.	.76	.66	.51	.86
18. I know my coach/athlete likes me.	.75	.66	.63	.78
19. I know I can rely on my coach/athlete.	.79	.62	.73	.68

Table 3 Descriptive Statistics for the Final Athlete and Coach Version of the 14-Item and 19-Item Coach-Athlete Attachment Scale (CAAS)

	Athlete CAAS				Coach CAAS			
Item	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis
1. I do not usually discuss my problems or concerns with my coach/athlete.	3.87	1.63	-.02	-.90	4.37	1.89	-.24	-1.12
2. I do not turn to my coach/athlete for reassurance.	3.41	1.52	.39	-.75	5.06	1.69	-.58	-.61
3. I avoid discussing personal issues with my coach/athlete.	4.16	1.65	-.16	-.85	4.95	1.90	-.57	-.91
4. I do not rely on my coach/athlete when I have a problem to solve.	4.03	1.41	-.22	-.44	4.81	1.68	-.34	-.84
5. I do not turn to my coach/athlete when I need to get something off my chest.	4.01	1.72	.02	-1.07	4.87	1.89	-.50	-.93
6. I do not ask my coach/athlete for advice and help.	3.10	1.53	.49	-.56	4.17	1.79	-.04	-1.03
7. I do not seek out my coach/athlete when things go wrong.	3.59	1.45	.27	-.47	4.60	2.01	-.34	-1.13
8. I often wonder if my coach/athlete cares about me as an athlete.	3.03	1.54	.57	-.43	2.97	1.48	.28	-.86
9. I often worry that my coach/athlete does not value me as much as I value him/her.	3.12	1.36	.27	-.52	2.86	1.48	.42	-.66
10. I worry a fair amount about my coach/athlete leaving me to coach/to be coached elsewhere.	2.60	1.37	.73	.12	2.30	1.47	1.14	.69
11. I am concerned that my coach/athlete will find another athlete/coach that he/she prefers.	2.86	1.49	.52	-.56	2.38	1.35	.69	-.52
12. I often worry that my coach/athlete does not want to coach me anymore.	2.62	1.36	.79	.09	2.38	1.42	.98	.28
13. Sometimes I worry that my coach/athlete is not as committed to me as I am to them.	3.03	1.39	.52	-.15	3.08	1.54	.25	-.76
14. I worry that my coach/athlete does not respect me as much as I respect him/her.	2.98	1.37	.41	-.43	2.84	1.43	.41	-.57
15. I know that my coach/athlete is loyal to me.	4.97	1.40	-.60	-.01	5.26	1.38	-.64	.02
16. I feel confident that our coach-athlete relationship will last.	4.85	1.48	-.66	-.00	5.26	1.36	-.73	.11
17. I find it easy to interact with my coach/athlete.	5.29	1.43	-.90	.10	6.01	1.19	-2.01	4.96
18. I know my coach/athlete likes me.	5.29	1.24	-.70	.55	5.43	1.29	-1.02	1.35
19. I know I can rely on my coach/athlete.	5.02	1.31	-.69	.37	5.38	1.25	-.72	.39

Note. 1–7 = anxious attachment; 8–14 = avoidant attachment; 15–19 = secure attachment

Further evidence for the convergent validity was obtained in the squared multiple correlation coefficients. According to Bollen (1989), these correlation coefficients represent the amount of variance in each indicator that is not accounted for by measurement error. Within M1a, values ranged from 0.35 to 0.57 (M = 0.47) in the avoidant dimension and from 0.16 to 0.54 (M = 0.37) for the anxious dimension. For M1c, values ranged from 0.26 to 0.54 (M = 0.47) for the avoidant dimension and from 0.30 to 0.52 (M = 0.41) for the anxious dimension. For M2a, values ranged from 0.37 to 0.55 (M = 0.47) for the avoidant dimension, from 0.15 to 0.54 (M = 0.41) for the anxious dimension, and 0.51–0.62 (M = 0.56) for the secure attachment dimension. Finally, M2c presented values that ranged from 0.25 to 0.38 (M = 0.39) for the avoidant dimension, from 0.32 to 0.51 (M = 0.41) for the anxious dimension, and 0.26–0.53 (M = 0.37) for the secure attachment dimension.

Discriminant Validity. The factor correlations, which are higher than Pearson's correlations because they are corrected for measurement error, are positively moderately correlated for M1a ($r_{\text{avoidant-anxious}}$ = .41) and weakly correlated for M1c ($r_{\text{avoidant-anxious}}$ = .08). Factor correlations for M2a are positively moderately correlated for avoidant and anxiety styles ($r_{\text{avoidant-anxious}}$ = .42), and inversely yet moderately correlated for avoidant and secure styles ($r_{\text{avoidant-secure}}$ = -.71), and anxious and secure styles ($r_{\text{anxious-secure}}$ = -.68). For M2c, factor correlations are weakly positively correlated for avoidant and anxious styles ($r_{\text{avoidant-anxious}}$ = .11), inversely and weakly correlated for avoidant and secure styles ($r_{\text{avoidant-secure}}$ = -.35), and inversely yet moderately correlated for anxious and secure styles ($r_{\text{anxious-secure}}$ = -.56). These findings suggest that factors of the two-dimensional and three-dimensional CAAS for both the coach and the athlete data are distinct from one another and as a result should be conceptualized as separate dimensions.

Measurement and Structural Models

According to Pennington (2003), criterion validity is a measure of how well a variable can predict and associate with an outcome. Within the attachment literature, attachment styles have consistently been found to predict relationship satisfaction within a number of close relationships (e.g., Collins & Read, 1990), including the coach-athlete relationship (Davis & Jowett, 2010). Therefore, in the current study, the concurrent validity was assessed by measuring the criterion variable of relationship satisfaction. Similar to the procedures taken with the CFA analysis, the robust maximum likelihood method was employed for each of the models within each *SEM* analysis because Mardia's coefficient was relatively high, suggesting non-normality of the data.

Criterion Validity. Full latent factor models using indicator variables to assess the associations between (a) the two first-order factor models and relationship satisfaction (one with the athlete data M3a and another with the coach data M3c), and (b) the two three first-order factor models and relationship satisfaction (one with the athlete data M4a and another with the coach data M4c), were tested. The recommended sample size to ratio of estimated parameters (10:1; Byrne, 2006) was acceptable for this assessment.

Testing the Two-Dimensional Model of CAAS and Relationship Satisfaction. The structural model for M3a demonstrated a satisfactory model fit: SRMR = 0.06; RMSEA = 0.05; RCFI = 0.96; RNNFI = 0.95, with 55% of the variance associated with athletes' perceptions of relationship satisfaction being accounted for by its predictors of athletes' avoidant and anxious attachment styles. For M3c, the structural model also demonstrated a satisfactory model fit: SRMR = 0.06; RMSEA = 0.05; RCFI = 0.94; RNNFI = 0.93, with 27% of the variance associated with coaches' perceptions of relationship satisfaction being accounted for by its predictors of avoidant and anxious attachment style. Figure 1 illustrates the significance and magnitude of the paths for M3a and M3c; only the structural models of the tested models are shown.

Testing the Three-Dimensional Model of CAAS and Relationship Satisfaction. The structural model for M4a demonstrated a satisfactory model fit: SRMR = 0.06; RMSEA = 0.04; RCFI = 0.97; RNNFI = 0.97, with 74% of the variance associated with athletes' perceptions of relationship satisfaction, accounted for by its predictors of avoidant, anxious, and secure attachment styles. M4c also demonstrated a satisfactory fit to the model: SRMR = 0.06; RMSEA = 0.05; RCFI = 0.92; RNNFI = 0.91, with 61% of the variance associated with coaches' perceptions of relationship satisfaction, accounted for by its predictors. Figure 2 illustrates the significance and magnitude of the paths of M4a and M4c; only the structural models of the tested models are shown.

Discussion

The purpose of the current study was to develop and psychometrically evaluate a self-report measure that examines fundamental aspects of attachment within the context of the coach-athlete dyad. A series of procedures including item generation and assessment of the items' content by experts in the field, as well as an investigation of the dimensionality of the selected items lends initial support for the psychometric properties of validity and reliability of the newly developed Coach-Athlete Attachment Scale (CAAS). Both a two first-order factor model of anxious and avoidant attachment styles and a three first-order factor model that also included the secure attachment style were tested for the athlete data and for the coach data separately. Results, following post hoc model fitting procedures, confirmed its theoretically-based factor structures. The development and validation of the two and three first-order factor models of CAAS (athlete and coach versions) begins the process of permitting researchers to assess attachment styles in the coach-athlete relational context.

The two first-order factor model is in line with scales that assess adult attachment in close and romantic/marital relationship contexts such as the ECR scale (Brennan et al., 1998). Two-dimensional scales focus on directly assessing insecure attachment styles, while the secure attachment style is inferred by low scores on both the anxious and avoidant attachment dimensions. While this may have been an acceptable way to measure attachment styles in adult attachment literature, a number of researchers have recently argued that the direct assessment of a secure attachment may be more beneficial (Backstrom & Holmes, 2007). With that in

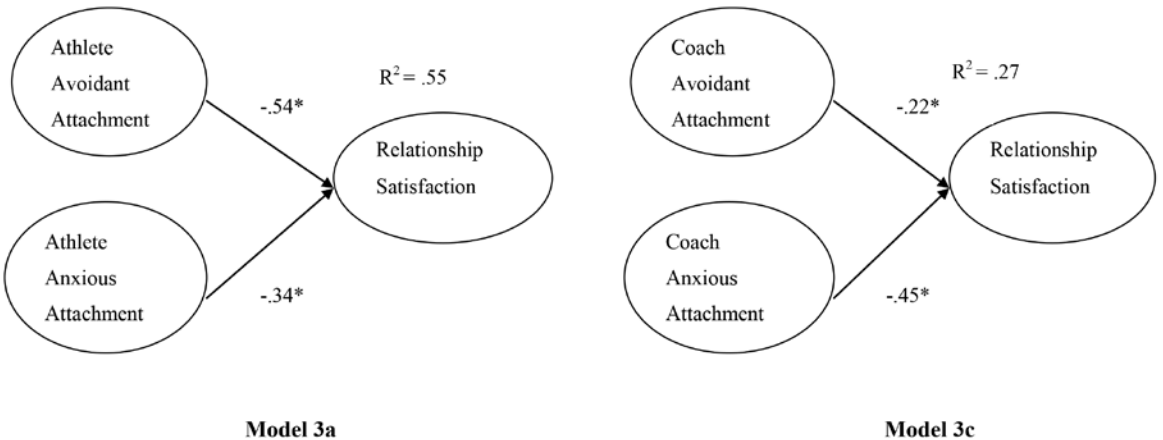

Figure 1 — M3a: Athletes' avoidant and anxious attachment styles as a predictor of relationship satisfaction. M3b: Coaches' avoidant and anxious attachment styles as a predictor of relationship satisfaction (note: *Significant path at $p < .05$).

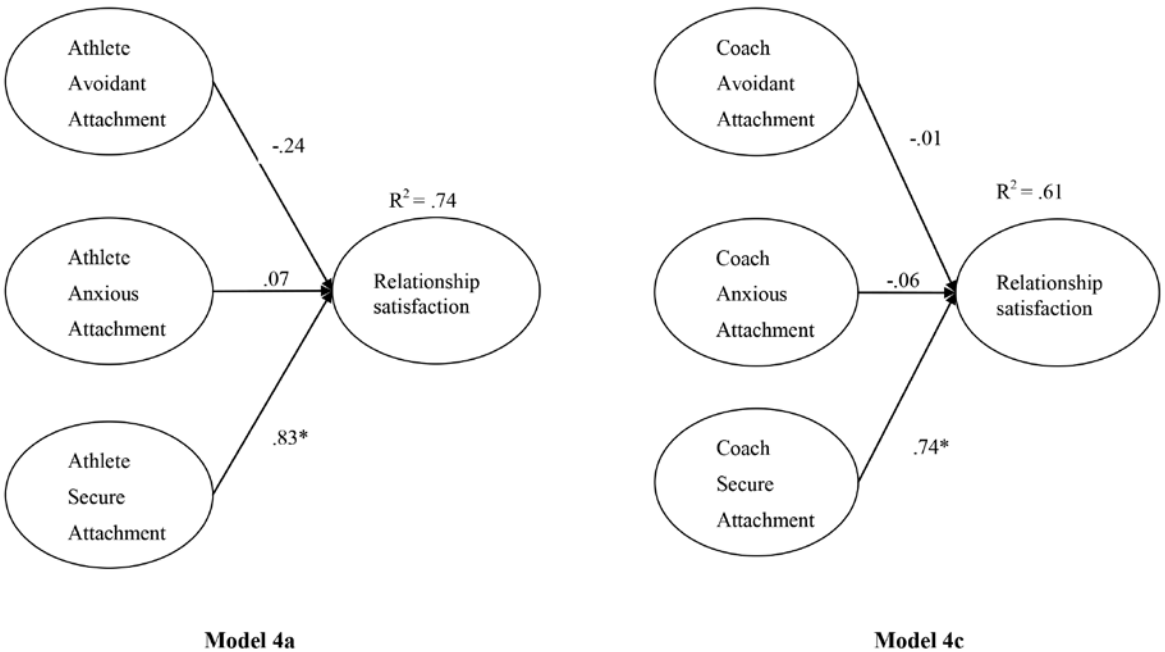

Figure 2 — M4a: Athletes' avoidant, anxious, and secure attachment styles as predictors of relationship satisfaction. M4b: Coaches' avoidant, anxious, and secure attachment styles as predictors of relationship satisfaction (note: *Significant path at $p < .05$).

mind, we tested a three-dimensional structure containing athletes' and coaches' two insecure and a secure attachment styles. CFA indicated satisfactory fit to the data for both the athlete version (M2a) and the coach version (M2c) of the three first-order factor structure of the CAAS. Furthermore, the internal consistency of the items for each of the three factors was satisfactory. In line with the work of Ainsworth et al. (1978), this three-dimensional measure would possibly allow for the direct measurement of all three attachment styles that underline individual differences in terms of relating, communicating, and interacting within the dyadic coach-athlete context.

The convergent validity of all four models tested was supported, as each of the items had substantial and significant loadings to their expected factor. Discriminate validity was also supported, and it was reflective of theoretically based assumptions of the orthogonality of insecure attachment dimensions (Brennan et al., 1998). This was indicated by each of the structures factor intercorrelations. For all the models tested, the associations between the avoidant dimension and anxious dimension were positively and moderately weak. For the two three-factor models of M2a and M2c, the correlations between the secure attachment dimension and insecure attachment dimensions were inversely yet moderately correlated for M2a, and inversely yet moderately to weakly correlated for M2c. These findings are in line with theory and research that indicate a weak association between the insecure attachment styles, and a negative association between the secure and insecure attachment styles (Backstrom & Holmes, 2007; Brennan et al.; Collins & Read, 1994).

It is worth noting, however, that the athlete version of the two-factor and three-factor CAAS recorded a moderately positively association between anxious and avoidant attachment styles. This reported association appears to be stronger compared with research that has found the two dimensions to be weakly correlated either positively or negatively (see Brennan et al., 1998). Nevertheless, although anxious and avoidant attachment styles have been operationalized as being two orthogonal dimensions (e.g., Brennan et al.; Mikulincer & Shaver, 2007), there is no consistent evidence within the attachment theory literature to suggest that the two insecure dimensions are indeed completely separate dimensions. It is possible that the association between the insecure dimensions is stronger for long-term relationship partners than for partners who have only been involved for a short period of time or are not seriously involved or committed in a single relationship, although this is an open empirical question at this time (Mikulincer, 2010, personal communication). While relationship length may be a potentially important factor in determining the strength of association between the two insecure attachment styles, it also may be that this association is dependent on the nature or type of relationship. It may be unrealistic to expect that athletes, for example, are entirely avoidant or entirely anxious in relation to their coach. The coach-athlete partnership requires a level of interdependence or closeness, be it in the form of trust, care, support, understanding, honesty, and/or appreciation (Jowett, 2007). Potentially, athletes reach out to their coaches for their expertise and knowledge, and as a result often have to set aside the sort of insecurities that are likely to prevent them from building a close, trustworthy, and committed relationship if they are to develop and succeed in sport. In other words, it is possible that within the coach-athlete relationship, athletes (and perhaps coaches) are classified as neither extremely avoidant nor extremely anxious; it thus may be possible that their classification 'folds' toward

a single insecure dimension. All of these possibilities require direct investigation. However, if correct, this conjecture would have clear implications for the theory and measurement of attachment styles within the coach-athlete relationship, and hence would warrant the attention of future research especially as this pertains to the cross-validation of CAAS.

It also is worth noting that both the two-dimensional models and the three-dimensional models tested revealed satisfactory fit to the data; while chi-square difference tests highlighted that both models were equally effective for the athlete data, for the coach data it was noted that there was a significant difference between the two-factor and three-factor model, indicating that coaches' attachment styles would be best represented by using the two-dimensional model. The three-dimensional model may be more beneficial for research that is concerned with understanding how secure attachment influences patterns of coach and athlete interactions and other important outcomes. Nonetheless, CAAS is a newly developed instrument, and as such, it is important that researchers continue to test its psychometric properties.

The concurrent validity of the athlete and coach version of the two-factor model was examined, and *SEM* analysis supported our hypothesis that attachment styles can serve as predictors of relationship satisfaction. The findings indicated that the avoidant and anxious attachment dimensions significantly predicted athletes' and coaches' perceptions of relationship satisfaction. These results are consistent with theoretical and empirical data from previous research that found romantic partners who were classified as having an anxious or avoidant attachment style experienced less relationship satisfaction (Collins & Read, 1994; Simpson, 1990). Furthermore, this finding also supports current coach-athlete attachment research that has found athletes' insecure attachment styles (anxious and avoidant) to be negatively associated with perceptions of relationship satisfaction and sport satisfaction variables (Davis & Jowett, 2010).

When the concurrent validity was examined for the three-factor model, our findings indicated that secure attachment style was a strong positive predictor of relationship satisfaction. This finding support previous research that has found that those individuals with a secure attachment tend to experience greater levels of relationship satisfaction (Collins & Read, 1994; Davidovitz et al., 2007; Davis & Jowett, 2010; Simpson, 1990). While secure attachment style was predictive of relationship satisfaction, neither of the two insecure attachment styles was predictive of relationship satisfaction within the three-factor model. One possible explanation for the inability of the two insecure attachment styles to predict relationship satisfaction may be due to the nature of the samples employed. Generally, it would appear that both the coach and the athlete sample were secure in their attachment with one another and satisfied with the relationship formed. If they had scored in the opposite direction, the results may have suggested a different pattern of association. Overall, the results suggest that secure attachment plays an important role in positively experiencing the coach-athlete relationship. The CAAS provides a direct assessment of the secure attachment style, while potentially allowing for an assessment of the variance that is accounted for by a secure dimension in other important variables. Future research should continue to test correlates of attachment styles to provide further information on the predictive and concurrent validity of the two-dimensional and three-dimensional CAAS for both the coach and athlete versions.

Limitations

There are several potential limitations to this study. Firstly, inherent to any self-report study, respondents may have been limited in the extent to which they were aware of and able to report on their own attachment styles and attitudes. Furthermore, self-report measures are subject to response bias, and largely rely on the participant's honesty and self-insight. According to Brennan et al. (1998), when one's fear and defenses are an issue (i.e., when the attachment system is activated), research participants' honesty and self-insight may become clouded, which in turn can influence the type of responses they provide. It is important to note, however, that self-report measures of attachment do not require participants to fully understand their own relationship dynamics, histories, or defenses to classify them (Brennan et al., 1998). In fact, it has been stated that such self-report measures only require a small amount of awareness of an individual's own feelings and beliefs about their relationships to capture the true essence of their attachment classification (Ravitz et al., 2010). Thus, although self-report measures of attachment hold these limitations, they still have positive implications for beliefs that individuals hold about themselves and their relationships (Brennan et al.). As a result, the versions of CAAS presented within this study could help determine beliefs that athletes and coaches hold about themselves and each other within the sporting arena.

In addition, this study used a variety of methods for data collection, including online data collection methods. While online data collection methods have been found to have advantages, such as allowing researchers to reach large samples of potential participants, reducing error and bias, and serving as expedient and cost effective methods, it is important to acknowledge challenges associated with collecting data using the Internet (Rhodes, Bowie, & Hergenrather, 2003). For example, challenges include: sample representativeness, competition for attention, assumptions about the "digital divide," literacy, and disability, as well as ethics-related issues (informed consent, anonymity, privacy, and completion of the measure by someone other than the intended participant). However, online data gathering would appear to have benefited the purpose of this study.

Aside from the potential limitations of self-reports, another limitation is the age of the athletes employed in this study. The study sought to validate the CAAS with adult athletes whose age was 18 and above, rendering its use with younger athletic populations questionable. According to attachment theory (Weiss, 1991), attachment functions tend to transfer from parents to other significant figures (including peers and other familial members) toward the end of childhood and when entering into early adolescence. Thus, it would be useful to examine the CAAS's utility and applicability with younger, prepubescent adolescents and older adolescent athletes.

Finally, we only attempted to examine the predictive validity of the CAAS by assessing how well each attachment dimension mapped onto one theoretically meaningful variable, namely relationship satisfaction. Assessing the predictive validity against other important variables (e.g., positive/negative affect, depression, sport satisfaction, 3Cs, self-concept, team cohesion, collective efficacy) would have added further evidence to the possible validity and utility of the CAAS. Future research should seek to examine a broad range of important correlates of attachment styles within the coach-athlete relational context. In addition, we did not seek to examine the instrument's concurrent validity, which is a critical component of

the validation process. Therefore, determination of the psychometric properties of the CAAS further requires examining this measure against other well established, valid, and reliable measures.

Future Research

The results from the current study provide preliminary data for the psychometric properties of the CAAS as a measure of attachment styles that reside either within a two-dimensional or a three-dimensional conceptual structure. In addition to the future research directions already mentioned in earlier sections of the discussion, future studies should investigate the invariance of CAAS in coaches and athletes, as well as males and females. Moreover, controlling for relationship length in these cross-validation studies may also help establish a better view of the convergent and discriminant validity of the instrument.

To our knowledge, this study is the first of its kind to present a measurement tool by which we can measure fundamental aspects of coach-athlete attachment. The CAAS (either the two- or three-dimensional measure) could be used to examine both cross-sectional correlational effects as well as longitudinal changes. Of particular interest would be research that examines the extent to which coaches' attachment styles have the capacity to influence their athletes' attachment styles over time. The corresponding coach and athlete versions of the CAAS could also enable researchers to conduct dyadic research, which over the past decade has been encouraged within sport-specific relationship research (e.g., Jowett & Clark-Carter, 2006; Lorimer & Jowett, 2009). An interesting line of research would be to explore the extent to which athletes' attachment styles affect their own perceptions as well as their coaches' perceptions of relationship quality and indicators of psychological well-being (e.g., affect, vitality, depression). Finally, it would be interesting to investigate how athletes' states of mind with regard to their attachment experiences influence their cognitive behavior such as competitive anxiety, which is considered to be an important factor in sport performance (Tenenbaum & Ecklund, 2007; Van Raalte & Brewer, 2002).

Conclusion

The present study was a preliminary study aimed to develop and examine the psychometric properties of a new context-specific attachment styles instrument known as the CAAS, based on theoretical assumptions and empirical data. This study has provided initial data on the psychometric properties of a two- and a three-dimensional scale. While we acknowledge that validation of psychometric instruments is a continuous process, the findings of this study highlight that CAAS has the potential to offer an insight to previously unexplored research questions. While there is much more research work to be carried out to add to the psychometric evidence of this study, this new instrument may be a useful addition to research investigating attachment styles as an individual difference characteristic in the coaching and sport context. The concept of attachment styles within the context of sport and coaching is currently understudied, yet is both theoretically and practically important.

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